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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,962	06/01/2001	James M. Reuter	P01-3663	4878

			EXAMINER
25235	7590	04/26/2005	NGUYEN, TRONG NHAN P

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ART UNIT	PAPER NUMBER
2152	

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/872,962	REUTER ET AL.
	Examiner	Art Unit	
	Jack P. Nguyen	2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM .
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

This action is in response to Applicant's amendment filed on 11/24/04. Claims 1-16 are being examined.

Response to Arguments

Applicant's arguments filed on 11/24/04 have been fully considered but they are not persuasive. Applicant asserts on page 4 Blumenau does not disclose or suggests "...a table having entries to map virtual disk positions to locations on storage devices." Blumenau explicitly discloses storage controller (27, fig. 1), via its storage adapters (37, 38, fig. 1), receives a data access request from a client (22, fig. 1); storage adapters process the request by searching their directory tables to determine where the data is stored in one of the storage volumes (28, 29, fig. 1) (col. 8, lines 56-62). Blumenau also discloses both the storage subsystem (20, fig. 1) and clients (22, 23, fig. 1) keep records (in table formats) of where the data is stored for retrieval and/or access (col. 30, lines 46-55; col. 32, lines 43-47). Applicant further asserts on page 5 Blumenau does not disclose nor suggest, "...storage controller that includes a second copy of a table that maps virtual disk positions to locations on the storage device." As stated above, each of the storage adapters (37, 38, fig. 1) keeps records of the tables where the data is stored in the storage volumes (28, 29, fig. 1) (col. 8, lines 56-62).

Applicant asserts on page 6 Blumenau does not suggest nor disclose, "...identifying portions of the virtual storage segment to be effected during the I/O operation." As stated above, Blumenau explicitly discloses the storage controller receives a data access/retrieval request from a client; the storage controller, via its

storage adapter, searches its directory tables to determine where the data is stored on

the disks. Once the data location is determined (thus effectively identifying the portions

of the storage devices where the data is being stored), the storage adapter performs I/O

(e.g., access, read, write, etc.) functions on the data in accordance to the client request

(col. 8, lines 56-65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Blumenau et al, 6,260,120 (Blumenau hereafter).

As per claim 1, Blumenau teaches a virtual storage system (20, fig. 1, col. 24,

lines 15-16) for mapping virtual storage segments of differing sizes to storage locations

(28, 29, fig. 1, col. 9, lines 15-19; storage volumes are mirrored with each other),

comprising: a host controller (61, fig. 4; host controller is functionally equivalent to an

agent) coupled to the host (22, fig. 4), the host controller storing a first table (fig. 30, col.

30, lines 53-55), the table having entries to map the virtual storage segments to the

storage locations (col. 8, lines 56-62; col. 30, lines 46-55; col. 32, lines 43-47; see

response to arguments above); and a storage controller (27, fig. 4; storage controller is

a component of a cache storage subsystem) coupled to the agent, the storage controller

having non-volatile memory for storing a second table (col. 8, lines 56-62; see also

response to arguments above), the host controller receives mapping updates from

storage controller (col. 25, lines 1-7) and uses the storage controller's mapping table

when its local copy is unavailable during an input/output (I/O) operation, the host

accesses one of the entries in the first table to determine one of the storage locations

(col. 32, lines 45-47). Blumenau does not explicitly teach the host controller having

volatile memory for storing first table. However, it is well known in the art use volatile

memory (RAM) in computing devices to store temporary data. It would have been

obvious to one of ordinary skill in the art to use volatile memory to ensure old, residual

data in memory is erased and refreshed with new, updated data when the computing

device first powered on.

As per claims 3 and 6, Blumenau teaches the second table further includes a

bitmap that having entries that correspond to blocks of data stored within the alternate

storage location (fig. 8, col. 17, lines 3-8). Blumenau does not specifically teach the

bitmap designating blocks at the alternative storage location to use for the I/O operation.

However, it is well known in the art to use second or backup location when the first

location is unavailable or busy. Hence, it would have been obvious to one of ordinary

skilled in the art to be motivated to perform I/O functions at a second location while the

first location is busy processing data in order not to interfere with the function being

performed or have to wait for the process to finish.

As per claim 7, Blumenau teaches first table having a first entry maing the virtual disk segment to the storage location (see claim 1 rejection); second table having a second entry corresponding to said storage location and to an alternative storage location (col. 8, lines 56-65; col. 9, lines 10-19; data are redundantly stored at plurality of storage locations; each storage adapter keeps its own mapping table to the data residing at plurality of storage locations in case of disks failures or other unforeseen events), and block bitmap information identifying blocks of data having differing sizes witin the alternate storage location (see claim 3 rejection); a plurality of variables indicating states of the entry (283, fig. 23, col. 26, lines 36-40); an offset for the entry, wherein the offset includes a logic unit number identifier (fig. 25) and a block identifier (fig. 34).

Claims 2, 4, 5, 8 and 9 are rejected for same reasons as claim 1 addressed above.

As per claims 10 and 11, Blumenau teaches the states include a no-write (col. 19, lines 15-21) and error (187, fig. 17) states.

As per claim 12, Blumenau teaches turning off input/output 'I/O' operations at the first storage location (col. 9, lines 16-19; when there is a disk failure at one of the storage locations, the system effectively shuts down any operations pertain to the failed disk); identifying portions of the virtual storage segment to be effected during the I/O operation (col. 8, lines 56-65; see also response to arguments above; I/O includes read/write); storing a record of the identified portions at a second table and not at the

first table (347, fig. 30; col. 31; lines 2-10; the client stores the mapping of portions of

the disks that it has access to in its directory table). Blumenau does not explicitly teach

writing to a second storage location associated with the identified portions by making

I/O operations at first location invalid. As previously stated in claim 3 above, it would

have been obvious to one of ordinary skill in the art to be motivated to write data to the

second location while the first location is busy so it would not interfere with any

processing that is taken place at the first location or one would not to have to wait for

the process at the first location to finish before writing new data.

Claim 13 is rejected for similar reasons as claim 12 above.

As per claim 14, Blumenau teaches applying security parameters to restrict

access to certain parts of the data (col. 31, lines 29-30, 35-38). Blumenau does not

explicitly teach a subsequent read operation occur at portions of the first storage

location not included in the identified portions and the portions of the second storage

location associated with the identified portions. It is known in the art to permit access to

new portions of second storage area where data that has been updated and restrict

access to the portions of first storage area data where the old, obsolete data is stored.

Hence, it would have been obvious to one of ordinary skilled in the art to perform this

function because it would prevent users from accessing old, inaccurate data of the first

storage area and only have access to new, updated data in the second storage location.

Claims 15-16 are rejected on same basis as claim 1 addressed above.

Blumenau further teaches each host has its own host controller that stores a copy of

mapping table as addressed in claim 1 (fig. 4).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jack P Nguyen whose telephone number is (703) 605-

4299. The examiner can normally be reached on M-F 8:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Glenton Burgess can be reached on (703) 305-4792. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the

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Business Center (EBC) at 866-217-9197 (toll-free). jpn

Dung C. Dinh
Primary Examiner